

WE CLAIM:

1. A method for the separation of a target molecule from a sample comprising:
  - 1) contacting (i) oil bodies with (ii) a sample containing the target molecule to allow the target molecule to associate with the oil bodies; and
  - 2) separating the oil bodies associated with the target molecule from the sample.
2. A method according to claim 1 wherein said target molecule associates with said oil bodies through a ligand molecule that associates with the oil bodies and the target molecule.
3. A method according to claim 2 wherein the ligand molecule is covalently attached to the target molecule.
4. A method according to claim 3 wherein the target molecule is a protein.
5. A method according to claim 3 wherein the ligand molecule is a protein.
6. A method according to claim 5 wherein the protein ligand is prepared as a fusion protein with the protein target molecule and wherein the ligand is not a protein that is normally associated with oil bodies.
7. A method according to claim 6 wherein the ligand molecule is an antibody or a fragment thereof.
8. A method according to claim 7 wherein the antibody binds to an oil body protein.

9. A method according to claim 7 wherein the antibody is a single chain antibody.
10. A method according to claim 1 wherein the sample is a cell.
11. A method according to claim 2 wherein the ligand is a bivalent antibody that binds to both the oil body and the target.
12. A method according to claim 8 wherein the oil body protein is an oleosin.
13. A method according to claim 12 wherein the oleosin is derived from a plant selected from the group consisting of rapeseed (*Brassica* spp.), soybean (*Glycine max*), sunflower (*Helianthus annuus*), oil palm (*Elaeis guineensis*), coconut (*Cocos nucifera*), castor (*Ricinus communis*), safflower (*Carthamus tinctorius*), mustard (*Brassica* spp. and *Sinapis alba*), coriander (*Coriandrum sativum*) linseed/flax (*Linum usitatissimum*), thale cress (*Arabidopsis thaliana*) and maize (*Zea mays*).
14. A method according to claim 1 wherein the oil bodies associated with the target molecule are separated from the sample in step (2) by centrifugation, floatation or size exclusion.
15. A method according to claim 1, further comprising 3) separating the target molecule from the oil bodies.
16. A method according to claim 15 wherein the target molecule is separated by elution under appropriate conditions.
17. A method according to claim 1 wherein the oil bodies are obtained from the group of plants consisting of rapeseed (*Brassica* spp.), soybean (*Glycine max*), sunflower (*Helianthus annuus*), oil palm (*Elaeis guineensis*), coconut (*Cocos nucifera*), castor (*Ricinus communis*), safflower (*Carthamus tinctorius*), mustard (*Brassica* spp. and *Sinapis alba*), coriander

(*Coriandrum sativum*) linseed/flax (*Linum usitatissimum*), thale cress (*Arabidopsis thaliana*) and maize (*Zea mays*).

18. A method according to claim 1 for the isolation of a recombinant polypeptide from a cell, said cell comprising oil bodies and the recombinant polypeptide, said method comprising:

(1) contacting (i) said oil bodies with (ii) said recombinant polypeptide to allow said recombinant polypeptide to associate with said oil bodies; and

(2) isolating said oil bodies associated with said recombinant polypeptide.

19. A method according to claim 18 wherein said recombinant polypeptide associates with said oil bodies through a ligand that associates with the recombinant polypeptide and the oil bodies.

20. A method according to claim 19 wherein said ligand is an antibody, an antibody fragment or a single chain antibody that binds to an oil body protein.

21. A method according to claim 19 wherein the ligand is a polypeptide and said recombinant polypeptide is prepared as a fusion protein with said ligand and wherein the ligand is not a protein that is

c) contacting (i) said oil bodies with (ii) said recombinant polypeptide to allow said recombinant polypeptide to associate with said oil bodies through said ligand; and

5 d) isolating said oil bodies associated with said recombinant polypeptide.

23. A method according to claim 22 wherein said recombinant polypeptide is prepared as a fusion protein with said ligand and wherein the ligand is not a protein that is normally associated with oil bodies.

10 24. A method according to claim 23 wherein said ligand is an antibody, an antibody fragment or single chain antibody that binds to an oil body protein.

25. A method according to claim 20 wherein said contacting results in the substantial disruption of the cell's integrity.

15 26. A composition comprising oil bodies associated with a ligand molecule covalently attached to a target molecule.

27. A composition according to claim 26 wherein the ligand molecule and the target molecule are proteins.

20 28. A composition according to claim 27 wherein the ligand molecule and target molecules are covalently attached as a recombinant fusion protein and wherein the ligand is not a protein that is normally associated with oil bodies.

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